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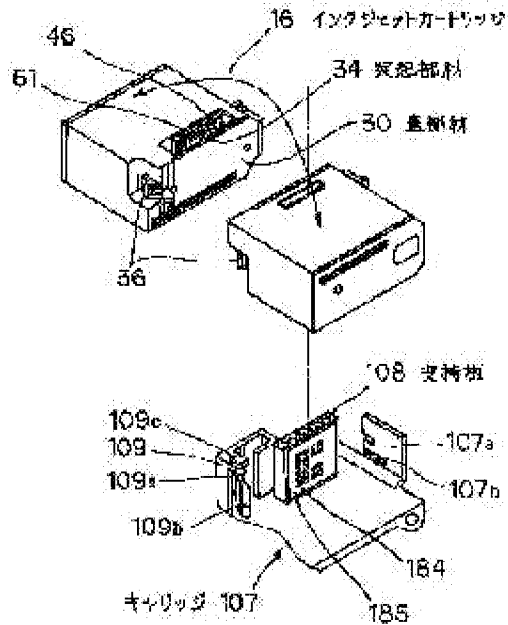
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(54) **INK JET CARTRIDGE**

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate damage of an ink jet recorder even when an ink cartridge is unreasonably mounted without correct combination in an ink jet recorder.
SOLUTION: A cover member 30 is fixed to the ink jet cartridge 16. A protrusion member 34 is provided as an erroneous mounting preventing means for preventing erroneous mounting in an ink jet recorder of an erroneous combination on a rear surface of the member 30. A breaking strength of the member 34 is set smaller than that of a support plate 108 interfered with the member 34 when the cartridge 16 is intended to be mounted in a carriage 107 provided in the recorder.



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CLAIMS

[Claim(s)]

[Claim 1] The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means The ink jet cartridge characterized by being set up smaller than the disruptive strength of the member of the ink jet recording apparatus in which said incorrect wearing prevention means interferes.

[Claim 2] Said incorrect wearing prevention means is an ink jet cartridge according to claim 1 which is a projection member.

[Claim 3] Said incorrect wearing prevention means is an ink jet cartridge according to claim 1 to which the disruptive strength of the fixed part of said outer wall member and said ink tank is set smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes including the outer wall member fixed to said ink tank possible [desorption].

[Claim 4] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the thermal melting start stage.

[Claim 5] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the adhesion means.

[Claim 6] Said outer wall member is an ink jet cartridge according to claim 3 currently fixed to said ink tank by the attachment means.

[Claim 7] Said incorrect wearing prevention means is the ink jet cartridge of six given in any 1 term from claim 1 currently arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed.

[Claim 8] Said ink jet recording head is the ink jet cartridge of seven given in any 1 term from claim 1 which has the electric thermal-conversion object which generates the heat energy used in order to make ink breathe out.

[Claim 9] Ink is an ink jet cartridge according to claim 8 breathed out using film boiling produced with the heat energy impressed with said electric thermal-conversion object.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink jet cartridge with which the ink jet recording apparatus which breathes out ink and records an image on recorded media is equipped.

[0002]

[Description of the Prior Art] With the recording device used as output units, such as a computer, and a word processor, a workstation, or the recording device used as an output means of a copying machine or facsimile, it is an image (an alphabetic character and a notation are included.). It is below the same. Based on the image information inputted into the recording device, it is recorded on recorded media including plastics sheet metal, such as a record form or an OHP sheet.

[0003] The so-called ink jet recording apparatus is in one of such the recording apparatus. An ink jet recording apparatus is a recording apparatus which breathes out ink to recorded media from the nozzle prepared in the ink jet recording head, and records an image on recorded media. Since it is that a highly precise image is recordable at high speed, that it is recordable on the regular paper by which special processing is not made, and a non impact type as an advantage of an ink jet recording device, it is known that the noise at the time of record is small, that it is easy to record a color picture using further multicolor ink, that the miniaturization of an ink jet recording head is easy, etc.

[0004] by the way, the thing of a configuration of that the ink tank was connected to the ink supply means to the ink jet recording head in an ink jet recording apparatus through the tube etc. at the ink jet recording head -- or there is a thing of various gestalten, such as a thing using the ink jet cartridge with which the ink jet recording head and the ink tank were united. Among those, for example it is carried in U.S. Pat. No. 4771295 (JP,63-84239,A) removable to a recording apparatus, and it is an exchangeable ink jet cartridge, and fills up with an ink absorber in an ink tank about an ink jet cartridge, and what is infiltrating ink into the ink absorber is indicated. In addition, such an ink jet cartridge is already marketed widely.

[0005] On the other hand, recently, the nozzle of an ink jet recording head is arranged more by high density, and record of a high definition image is attained. For example, the color picture record not only using alphabetic character record but the color ink only using black ink and record of a still high definition photograph tone image are also attained. The thing not only using what the class of ink used with a recording device was also becoming various in connection with this, for example, melted the color to the drainage system solvent about black ink but a pigment, the thing which has a water resisting property even if it is a color are used. About color ink, moreover, by making light concentration of each color of not only the ink of mere yellow, MAZENDA, and cyanogen but ink Gradation nature is given to the lightness between the monochrome part in a record image, and the part which two or more colors piled up, and red, Green, and blue ink are also used for the ink of the yellow which can acquire more nearly high-definition record image quality, MAZENDA, and cyanogen, and a pan. The class of ink jet cartridge is increasing according to such a background, and the class of ink jet

recording device is also increasing that it should correspond to each ink jet cartridge.

[0006] By the way, since many components are communalized in order that an ink jet cartridge and an ink jet recording device may aim at reduction of a production cost, and compaction of a development cycle, the configuration is similar for various kinds. Then, an ink jet recording apparatus and it can be equipped, and user support is performed by explanation at a shop front, and a catalog and an operation manual about combination with an ink jet cartridge recordable good. However, there is not no possibility that a user will equip with the ink jet cartridge which does not support an ink jet recording apparatus accidentally. When equipped with the ink jet cartridge which does not support an ink jet recording apparatus, since drive conditions differ, in the printer driver with which the ink jet recording apparatus is equipped, the case where record is not carried out at all by the difference in the discharge quantity of an ink class or ink, the difference in a nozzle consistency, etc., or a normal image is not recorded may be generated.

[0007] Then, in order to prevent such a situation, at least one side of an ink jet recording apparatus and an ink jet cartridge is equipped with the discernment means for identifying whether it is incorrect wearing. While preparing heights in an electric discernment means identify incorrect wearing by reading with a signal reading means to by_ which the recognition signal given to the ink-jet cartridge is established as a discernment means at the ink-jet recording device side, and an ink-jet cartridge, in an ink-jet recording device, the crevice into which the heights of an ink-jet cartridge fit establishes, and there is a structural discernment means identify incorrect wearing in it, in the mistaken combination by being unable to equip an ink-jet recording device with an ink-jet cartridge, and carrying out it.

[0008] Among the above-mentioned discernment means, with an electric discernment means, after being equipped with an ink jet cartridge, it is identified whether it was incorrect wearing. However, the delivery side of the nozzle of an ink jet cartridge is protected to an ink jet recording apparatus, or the capping means for attracting ink is formed in it from the nozzle, and the ink of an ink jet cartridge with which the ink jet recording apparatus was equipped before remains in this capping means somewhat. Therefore, if a KYAPINGU means contacts the nozzle of the ink jet cartridge with which it was newly equipped, heterogeneous ink will be mixed on the front face of a nozzle and a capping means. thus, the cause of fixing of ink being promoted if heterogeneous ink is mixed -- especially, with the nozzle of an ink jet recording head, since ink is not normally breathed out until the ink which fixed after starting record is removed, the recorded image may become blurred When fixing of ink progresses further, the nozzle of an ink jet recording head is got blocked, or it is considered that a capping means also stops functioning normally.

[0009] On the other hand, among the above-mentioned discernment means, with the structural discernment means, only when the heights prepared in the ink jet cartridge and the crevice established in the ink jet recording apparatus are the cases where an ink jet cartridge and a recording apparatus are right combination, it is prepared so that it can fit in and equip. Thereby, since incorrect wearing of an ink jet cartridge can be prevented beforehand, heterogeneous ink is not mixed as mentioned above.

[0010] So, the above-mentioned structural discernment means is widely used for the discernment means of incorrect wearing of an ink jet cartridge.

[0011]

[Problem(s) to be Solved by the Invention] However, in the case where the above-mentioned structural discernment means is used, in spite of being the combination which the ink jet recording apparatus and the ink jet cartridge mistook, when unreasonableness has been equipped with the ink jet cartridge, with a user not noticed, at least one side will be damaged among an ink jet recording apparatus and an ink jet cartridge. When an ink jet cartridge side is damaged, if the ink jet cartridge of another normal is prepared, it can record immediately. However, when an ink jet recording apparatus side is damaged, it will be necessary to fix an ink jet recording apparatus, the burden which a user receives since it becomes impossible to use an ink jet recording apparatus is large during a repair period, and the breakage by the side of an ink jet recording apparatus is not desirable. [0012] Then, this invention aims at offering the ink jet cartridge which has the incorrect wearing prevention means which does not damage an ink jet recording apparatus even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force.

[0013]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink jet cartridge of this invention The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means It is set up smaller than the disruptive strength of the member of the ink jet recording device in which said incorrect wearing prevention means interferes.

[0014] Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force by this, before the part in which an incorrect wearing prevention means interferes among the members in an ink jet recording apparatus is damaged, the incorrect wearing prevention means of an ink jet cartridge is damaged.

[0015] Moreover, when said incorrect wearing prevention means is a projection member, it is recognized by the user by a feel and an acoustic sense in case a projection member is damaged that it is incorrect wearing.

[0016] Furthermore, said incorrect wearing prevention means contains the outer wall member fixed to said ink tank possible [desorption]. By setting up smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes the disruptive strength of the fixed part of said outer wall member and said ink tank Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force, an outer wall member is desorbed from an ink tank. Therefore, compared with the case where only a projection damages and ****s, it is clearly recognized by the user that it is incorrect wearing.

[0017] In addition, as for said outer wall member, it is desirable to be fixed to said ink tank by the thermal melting start stage, the adhesion means, or the attachment means.

[0018] Moreover, even if said incorrect wearing prevention means is the ink jet cartridge by which the incorrect wearing prevention means was destroyed by incorrect wearing by

being arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed, the function which an ink jet cartridge has is not spoiled. [0019]

[Embodiment of the Invention] Next, the operation gestalt of this invention is explained with reference to a drawing.

[0020] The outline of 1 operation gestalt of an ink jet recording device in which first use drawing 1 and the ink jet cartridge of this invention is used is explained. Drawing 1 is the perspective view showing the outline configuration of 1 operation gestalt of the ink jet recording device with which the ink jet cartridge of this invention is used.

[0021] As shown in drawing 1, the leading screw 2 by which spiral slot 2a was minced is supported by the ink jet recording device 1 free [rotation]. Through the driving force transfer gear 6 prepared in the leading screw 2, and the driving force transfer gear 5 which is bit and put together and is prepared in the driving force transfer gear 6, a leading screw 2 is interlocked with the forward inverse rotation of a drive motor 4, and is rotated. Moreover, the pin (un-illustrating) prepared in the part which supports a leading screw 2 engages with spiral slot 2a, and the carriage 7 with which the ink jet cartridge 16 is carried is formed free [sliding] to the leading screw 2 and the guide rail 3. Since the forward inverse rotation of a drive motor 4 is interlocked with and a pin is guided to spiral slot 2a by this, carriage 7 moves in accordance with the shaft orientations (X shaft orientations of illustration) of a platen roller 11. Paper feed of the recorded media 10, such as a record form and plastics sheet metal, is carried out by the platen roller 11. In addition, in the range which meets the ink jet recording head (un-illustrating) of the ink jet cartridge 16 among the front faces of recorded media 10, it is formed more broadly than a platen roller 11, and recorded media 10 are pressed by the peripheral surface of a platen roller 11 with the paper bail plate 12 formed along the migration direction of carriage 7.

[0022] Moreover, the ink jet recording apparatus 1 is equipped with photo couplers 13 and 14 as a home-position detection means for detecting passage of the lever 15 prepared in carriage 7, and performing the change of the hand of cut of a drive motor 4 etc. Furthermore, in the location (for example, home position) from which the ink jet recording head of the ink jet cartridge 16 separated from the record section, the capping means 20 of a wrap (capping) sake is arranged in the location which meets an ink jet recording head in the ink delivery side of an ink jet recording head. The KYAPINGU means 20 is supported by the supporter material 21, it has a suction means 22 to attract ink from the ink delivery of an ink jet recording head further, and suction recovery of an ink jet recording head is performed by attracting the ink delivery of an ink jet recording head through the opening 23 in a cap.

[0023] The cleaning blade 26 which the support plate material 25 is attached and was supported by the support plate material 25 possible [sliding] is formed in Y shaft orientations of illustration movable by the driving means (un-illustrating), and cleaning of an ink jet recording head is performed in the frame part material 24 of the ink jet recording device 1 by contacting and estranging to an ink jet recording head.

[0024] The cam 28 is formed in the location which contacts when it moves to a location with carriage 7. The lever 27 is formed so that it may interlock and may carry out movable to the cam 28 moved to carriage 7. In connection with a motion of a lever 27, transfer of the driving force from a drive motor 4 is controlled by controlling the power

means of communication of common knowledge, such as a gear 29 and a clutch (un-illustrating).

[0025] When carriage 7 moves to a home-position field, alignment of each processing stroke of the above-mentioned capping, suction recovery, and cleaning is carried out to the location where an ink jet recording head meets the opening 23 in a cap, or a cleaning blade 26, and it is performed. These each processing stroke and alignment strokes of an ink jet recording head can be performed in the mode of arbitration using well-known timing and a well-known sequence. Moreover, each of these processing strokes may be performed independently and may be performed complexly.

[0026] In addition, the ink jet recording apparatus 1 may be equipped with an electric discernment means to identify incorrect wearing, by reading with a signal reading means by which the recognition signal given to the ink jet cartridge 16 is established at the ink jet recording apparatus 1 side.

[0027] Next, the configuration of 1 operation gestalt of the ink jet cartridge of this invention is explained. The perspective view in which drawing 2 shows the whole 1 operation gestalt configuration of the ink jet cartridge of this invention, the fluoroscopy perspective view of the ink jet recording head in the ink jet cartridge which showed drawing 3 to drawing 2 , and drawing 4 R> 4 are the decomposition perspective views of the ink jet cartridge shown in drawing 2 .

[0028] As shown in drawing 2 and drawing 4 , the ink jet cartridge 16 has the structure where the ink jet unit 18 equipped with the ink jet recording head 17 and the ink tank 19 which holds ink were attached to one.

[0029] The perspective view shown where drawing 5 is seen from [which showed the ink jet cartridge shown in drawing 2 to drawing 2] A, and drawing 6 are the perspective views showing the rear face of covering device material shown in drawing 5 .

[0030] As shown in drawing 5 , the covering device material 30 forms the enclosure 31 which surrounds and contains the ink jet unit 18 between the ink tanks 19 while being some outer walls of the ink jet cartridge 16. Moreover, the claw part 36 which engages with hook 9a (refer to drawing 8) of the carriage 7 mentioned later is formed in the ink jet cartridge 16. The covering device material 30 is being fixed to the ink tank 19 in the two welding sections 32 and 33. In addition, as shown in drawing 5 and drawing 6 , the projection member 34 as an incorrect wearing prevention means to prevent incorrect wearing to the mistaken ink jet recording device of combination is formed in the rear face of the covering device material 30. Moreover, as shown in drawing 6 , the pin hole 35 is formed in the welding sections 32 and 33 at the covering device material 30. Two welding pins (un-illustrating) prepared in the ink tank 19 are inserted in two pin holes 35 of the covering device material 30, respectively, and caulking immobilization of the covering device material 30 is carried out to the ink tank 19 by crushing the head of a welding pin by heat. With this operation gestalt, the covering device material 30 is formed with Noryl resin, and the magnitude of the projection member 34 is formed in about 0.5mm in height of about 3mm, 4mm of ****, and thickness. In addition, the molding material of the covering device material 30, the configuration of the projection member 34, and a dimension are not limited above.

[0031] Then, the configuration of the ink jet recording head 17 is explained.

[0032] As shown in drawing 3 , two or more deliveries 37 are established in seriate, and the liquid ink way 39 for supplying ink is arranged in each delivery 37 by the ink jet

recording head 17. The electric thermal-conversion object 38 which generates heat energy with the supplied applied voltage as an energy component for making ink breathe out from a delivery 37 is arranged in each liquid ink way 39. By impressing a driving signal to each electric thermal-conversion object 38 alternatively according to a picture signal, ink is made to produce film boiling with the heat energy generated from the electric thermal-conversion object 38, and air bubbles are generated in the liquid ink way 39. By growing up these air bubbles further, an ink droplet is breathed out from a delivery 37.

[0033] In addition, each electric thermal-conversion object 38 is established on the heater board 40 which consists of a silicon substrate, and is formed in one by the membrane formation technique by semi-conductor manufacture processes, such as etching, vacuum evaporation, and sputtering, with wiring and the electrode (un-illustrating) of the aluminum which supplies power to each electric thermal-conversion object 38. A delivery 37 can manufacture easily by this the ink jet recording head 17 arranged by high density, and much more miniaturization of the ink jet recording head 17 can be attained. Moreover, by utilizing the advantage of IC technique or a micro processing technique, long-picture-izing of the ink jet recording head 17 and shape[of a field]-izing (two-dimensional-izing) are also easy, and the formation of full multi and high-density-assembly-izing of the ink jet recording head 17 are also still easier.

[0034] Moreover, the top plate 42 with which the common liquid room 41 which contains temporarily the septum for classifying each liquid ink way 39 and the ink supplied to each liquid ink way 39, the ink receiving window 43 (refer to drawing 4) for introducing ink into the common liquid room 41 from the ink tank 19, etc. were formed is really fabricated. As a molding material of a top plate 42, although polysulfone is desirable, other molding resin ingredients, such as polyether sulfone, polyphenylene oxide, and polypropylene, may be used.

[0035] Next, the configuration of the ink jet unit 18 is explained.

[0036] As shown in drawing 4 , the metal base material 45 has the holes 50, 51, and 52 which engage with two projections 47a and 47b for positioning prepared in the ink tank 19, and two projections 48 and 49 (projection 49 is referring to drawing 7) for thermal melting arrival maintenance, and also has the projections 53 and 54 for positioning to carriage 7. In addition, a base material 45 is made to penetrate the ink supply pipe 55 mentioned later, and the hole 56 for forming the ink passage from the ink tank 19 is formed. In addition, near the projections 53 and 54 for positioning of a base material 45 crevices 57 and 58 are formed, respectively. Crevices 57 and 58 In the assembled ink jet cartridge 16 (refer to drawing 2) By being located on the production of the parallel slots 59 and 60 of each plurality formed in three sides around the ink jet unit 18 in the ink jet cartridge 16, it is constituted so that discard, such as dust and ink, may not result in projections 53 and 54.

[0037] The wiring substrate 46 is stuck on the base material 45 by the binder etc. Two or more pads 61 for receiving the electrical signal from the ink jet recording device 1 are formed in the end of the wiring substrate 46, and the wiring part of the heater board 40 which is also the substrate of the ink jet recording head 17 is connected to the other end. Each pad 61 supports each electric thermal-conversion object 38 (refer to drawing 3) prepared in the ink jet recording head 17, and the electrical signal from the ink jet recording device 1 passes along each pad 61, and is supplied to each electric thermal-

conversion object 38 according to an individual.

[0038] The pressure spring 62 for fixing the ink jet recording head 17 to a base material 45 is formed in the M character configuration. The heater board 40 and the top plate 42 are arranged between the pressure spring 62 and the base material 45, and the heater board 40 and a top plate 42 are fixed in the condition of having been put between the pressure spring 62 and the base material 45, by making the foot of a pressure spring 62 engage with the rear-face side of a base material 45 through the hole 63 of a base material 45. while the part of the outer wall of the common liquid room 41 (refer to drawing 3) is pressed by the center section of the shape of an M typeface of a pressure spring 62 by light pressure among the outer walls of a top plate 42 at this time -- a pressure spring 62 - - front -- the who section 64 -- a part of liquid ink way 39 (refer to drawing 3) of the ink jet recording head 17 -- the intensive press of the about 37-delivery field is preferably carried out with the linear pressure.

[0039] the ink which the ink supply pipe 55 is formed in the ink feed zone material 65 for supplying the ink supplied from the ink tank 19 to the ink jet recording head 17 in the shape of a cantilever, and was connected with the ink supply pipe 55 -- a conduit 66 has - - having -- further -- ink -- the closure pin 67 for securing the capillarity between a conduit 66 and the ink supply pipe 55 is inserted. In addition, the closure of the bond part of the ink tank 19 and the ink supply pipe 55 is carried out by press fit.

[0040] Since the ink feed zone material 65 is really fabricated by mold shaping, its dimensional accuracy of each part is high. for example, ink -- since the dimensional accuracy of each part of the ink feed zone material 65 is high, the pressure-welding condition over the ink receiving window 43 of a conduit 66 is stable. here -- ink -- if the adhesives for closure resin are slushed from the ink feed zone material 65 side where the pressure welding of the conduit 66 is carried out to the ink receiving window 43 -- ink -- the more positive free passage condition of a conduit 66 and the ink receiving window 43 can be acquired. Moreover, immobilization of the ink feed zone material 65 to a base material 45 is simply performed by making the holes 68 and 69 of a base material 45 penetrate two pins (un-illustrating) currently formed in the ink feed zone material 65, and carrying out thermal melting arrival of the pin. In addition, few lobes produced in the ink tank 19 side of a base material 45 are stored by having carried out thermal melting arrival of the pin in the hollow (un-illustrating) formed in the side face of the anchoring section of the ink jet unit 18 among the front faces of the ink tank 19. Therefore, trouble is not caused to positioning at the time of attaching the ink jet unit 18 in the ink tank 19.

[0041] Next, the configuration of the ink tank 19 is explained.

[0042] As shown in drawing 4, the ink tank 19 is assembled by closing the ink absorber 71 with the tank lid 72, after consisting of a cartridge body 70, an ink absorber 71 which sinks in and holds ink, and a tank lid 72 and inserting the ink absorber 71 from the opposite side by the side of ink jet unit anchoring section 19a. The ink feed hopper 73 prepared in ink jet unit anchoring section 19a of the ink tank 19 is for supplying ink to the ink jet unit 18, and the filter (un-illustrating) is prepared in the interior of the ink feed hopper 73. Moreover, the atmospheric-air free passage opening 74 for making atmospheric air open the interior for free passage is formed in the ink tank 19, and ***** 75 which prevents that ink is revealed from the atmospheric-air free passage opening 74 is being further inserted and fixed to the atmospheric-air free passage opening 74.

[0043] The configuration of ink jet unit anchoring section 19a of the ink tank 19 is explained using drawing 7 and drawing 4. Drawing 7 is the perspective view showing ink jet unit anchoring section 19a in the ink tank 19 shown in drawing 4.

[0044] As shown in drawing 7 and drawing 4, it sets to ink jet unit anchoring section 19a of the ink tank 19. the delivery 37 of the delivery plate 44 fabricated by the front face of a top plate 42 at one -- almost -- a core -- a passage -- the ink tank 19, if a straight line parallel to the datum level of base 19b is set to L1. On the straight line L1, two projections 47a and 47b which engage with two holes 50 currently formed in the base material 45 are formed. Projections 47a and 47b position the base material 45 to ink jet unit anchoring section 19a, and the height of Projections 47a and 47b is slightly formed low rather than base material 45 thickness.

[0045] Moreover, projections 48 and 49 are formed in ink jet unit anchoring section 19a. Projections 48 and 49 correspond to the holes 51 and 52 for immobilization to ink jet unit anchoring section 19a currently formed in the base material 45, are formed for a long time than Projections 47a and 47b, and fix a base material 45 to ink jet unit anchoring section 19a by carrying out thermal melting arrival of the part which penetrated and projected the base material 45.

[0046] On the straight line L3, if it is perpendicular to a straight line L1 and the line which passes along L3 and projection 49 the straight line which passes along projection 48 is set to L2, since a core is located mostly, the free passage condition of the ink feed hopper 73 and the ink supply pipe 55 is stabilized, and a possibility of the ink feed hopper 73 that a free passage condition may be spoiled by impacts, such as fall of the ink jet cartridge 16, is mitigated. Moreover, since a straight line L2 and a straight line L3 are not in agreement and projections 48 and 49 exist around projection 47a, improvement of the positioning accuracy of the ink jet recording head 17 to ink jet unit anchoring section 19a is achieved. In addition, a curve L4 is the outer wall location of the ink feed zone material 65 when ink jet unit anchoring section 19a is equipped with the ink jet unit 18. The fixed condition is stable and the fixed position of the ink feed zone material 65 seems not to shift easily, since the ink feed zone material 65 is fixed to the location which met mostly the projections 48 and 49 which are fixed parts in this way although weight is concentrating the ink jet unit 18 on the part in which the ink feed zone material 65 is formed.

[0047] Furthermore, the flange 76 prepared in the ink tank 19 is inserted in flange slot 7b (refer to drawing 8) currently formed in carriage 7, and it is prevented that the posture of the ink jet cartridge 16 over carriage 7 gets extremely bad. Moreover, even if the external force which makes the ink jet cartridge 16 secede from carriage 7 according to a certain cause by engaging with the hook section (un-illustrating) which is prepared in ink jet unit anchoring section 19a of the ink tank 19, from which it escapes, and by which the stop 87 is formed in carriage 7 acts, the wearing condition of the ink jet cartridge 16 is maintained.

[0048] As shown in drawing 5, the ink tank 19 is constituted by covering ink jet unit anchoring section 19a by the covering device material 30 so that the ink jet unit 18 may be surrounded except for lower part opening 16a, after being equipped with the ink jet unit 18. However, since lower part opening 16a is closed by the front face of carriage 7 when the ink jet cartridge 16 is carried in carriage 7, the enclosure 31 which surrounds the ink jet unit 18 depending on the methods of four substantially will be formed.

Therefore, generation of heat from the ink jet unit 18 established in this enclosure 31 is effective as what distributes to homogeneity and keeps the inside of this space warm in this enclosure 31. However, when the ink jet recording device 1 uses it, having carried out long duration continuation, few temperature ups may be produced in an enclosure 31. For this reason, equalization of the temperature distribution of the ink jet unit 18 whole is realized, without being influenced by the external environment, forming the slit 78 of width of face smaller than this enclosure 31 in the roof section 77 of the ink tank 19, and preventing the temperature up in an enclosure 31, as shown in drawing 2 , in order to help the natural heat dissipation from the ink jet unit 18.

[0049] As shown in drawing 4 , inside the ink jet cartridge 16 Ink the hole 56 of the ink feed hopper 73 and a base material 45 from the interior of the cartridge body 70 A passage, After being supplied in the ink feed zone material 65 through the inlet established in the inside rear-face side of the ink feed zone material 65 and passing along the interior of the ink feed zone material 65, it flows into the common liquid room 41 (refer to drawing 3) through the ink receiving window 43 of a top plate 42. The closure members 79 which consist of silicon, isobutylene isoprene rubber, etc., such as packing and an O ring, are arranged, the closure is performed in the connection of the supply way of the above ink by this, and an ink supply way is secured to it.

[0050] As mentioned above, respectively, since the ink feed zone material 65, a top plate 42, and the cartridge bodies 70 are really shaping components, they are cheap and are very effective in upgrading of not only being formed highly but mass production method.

[of dimensional accuracy] Moreover, since components mark are decreasing compared with the former, the outstanding property [exhausting] can be demonstrated certainly.

[0051] As return and the assembled ink jet cartridge 16 are shown at drawing 2 , the clearance 81 is formed at explanation of the ink jet cartridge 16 whole between the top-face section 80 of the ink feed zone material 65, and the edge of the roof section 77 in which the slit 78 of the ink tank 19 was formed. Similarly, the clearance (un-illustrating) is formed also between the inferior-surface-of-tongue section 82 (refer to drawing 4) of the ink feed zone material 65, and the sheet metal member 83 (refer to drawing 7) prepared in the lower part of ink jet unit anchoring section 19a of the ink tank 19. These clearances have prevented that external force carries out a direct action to the ink jet unit 18 by absorbing the unnecessary external force which acts on the ink jet cartridge 16 while assisting the heat dissipation effectiveness in a slit 78.

[0052] Next, the configuration of the carriage 7 in the ink jet recording apparatus 1 of this operation gestalt is explained. Drawing 8 R > 8 is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1 .

[0053] As explained using drawing 1 , carriage 7 moves in accordance with the shaft orientations of a platen roller 11. As shown in drawing 8 , dark room 7a is prepared in the part which counters a platen roller 11 (refer to drawing 1) at carriage 7. Flange slot 7b in which the flange 76 (reference, such as drawing 2) prepared in the outer wall of the ink jet cartridge 16 is inserted is formed in dark room 7a.

[0054] Moreover, the support plate 8 for electrical connection is formed in carriage 7. The flexible sheet 85 which has the pad 84 corresponding to the pad 61 of the wiring substrate 46 is formed in the field which meets the wiring substrate 46 when equipped with the ink jet cartridge 16 among the front faces of a support plate 8. In addition, the

rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background. On the other hand, when equipped with the ink jet cartridge 16 among the front faces of a support plate 8, notch 8a for avoiding interference with the projection member 34 is formed in the part along which the projection member 34 prepared in the covering device material 30 of the ink jet cartridge 16 passes.

[0055] Furthermore, carriage 7 is equipped with hook 9a for fixing the ink jet cartridge 16. Hook 9a is prepared free [rotation] to fixed shaft 9c prepared in the hook susceptor 9 for supporting hook 9a, and hook side 9b which engages with the claw part 36 of the ink jet cartridge 16 is formed at the tip of hook 9a.

[0056] Next, the process in which the carriage of an ink jet recording apparatus is equipped with an ink jet cartridge is explained.

[0057] First, the case where an ink jet cartridge and an ink jet recording device are right combination is explained using drawing 8 and drawing 9 . Here, when an ink jet cartridge and an ink jet recording apparatus are right combination, the case where the ink jet recording apparatus 1 and the ink jet cartridge 16 which were explained above are combined is said.

[0058] Drawing 9 is the plan showing the condition of equipping the carriage in the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 . In addition, in drawing 9 , only the support plate 8 of the ink jet cartridge 16 and carriage 7 is shown, and the roof section 77 (refer to drawing 2) of an ink tank omits, and is drawn.

[0059] As shown in drawing 8 , the field which has lower part opening 16a of the ink jet cartridge 16 is made to meet the front face of carriage 7, and lower part opening 16a is inserted in the support plate 8 of carriage 7. Since notch 8a is prepared in the support plate 8 as shown in drawing 8 and drawing 9 , a support plate 8 does not interfere in the projection member 34 prepared in the ink jet cartridge 16, and carriage 7 is normally equipped with the ink jet cartridge 16.

[0060] If carriage 7 is equipped with the ink jet cartridge 16 and the base of the ink jet cartridge 16 touches the front face of carriage 7, the flange 76 of the ink jet cartridge 16 will be inserted in flange slot 7b currently formed in dark room 7a of carriage 7. Subsequently, when hook 9a with which carriage 7 is equipped is rotated and hook side 9b is made to engage with the claw part 36 of the ink jet cartridge 16, the ink jet cartridge 16 is fixed to carriage 7.

[0061] Since the pressure welding of the wiring substrate 46 of the ink jet cartridge 16 is carried out to the flexible sheet 85 of a support plate 8 at this time, the pad 84 of the flexible sheet 85 and the pad 61 of the wiring substrate 46 will be contacted. Thereby, a record signal comes to be transmitted to the ink jet cartridge 16 from the ink jet recording apparatus 1. In addition, since the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background, the increase of the contact pressure between each pad 61 and 84 and a contact condition are stable.

[0062] In addition, when the ink jet recording apparatus 1 and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which the display panel (un-illustrating) of the ink jet recording apparatus 1 was correctly equipped with the ink jet cartridge is indicated.

[0063] Next, the case where it is the combination which the ink jet cartridge and the ink jet recording device mistook is explained using drawing 10 and drawing 11. Here, the case where it is the mistaken combination means the case where an ink jet cartridge and the ink jet recording device which cannot be used even if it equips with the ink jet cartridge are put together.

[0064] The perspective view showing the condition of equipping with drawing 10 the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 was mistaken, and drawing 11 are the plans showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 R> 2 was mistaken. In addition, in drawing 11, only the support plate 108 of the ink jet cartridge 16 and carriage 107 is shown, and the roof section 77 (refer to drawing 2) of the ink tank 19 omits, and is drawn.

[0065] As shown in drawing 10 and drawing 11, the notch for preventing interference with the projection member 34 of the ink jet cartridge 16 is not prepared in the support plate 108 in the mistaken ink jet recording apparatus of combination. In addition, the disruptive strength of the projection member 34 is set up smaller than the disruptive strength of a support plate 108. In addition, since each part of carriage 107 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0066] Thus, since the projection member 34 of the ink jet cartridge 16 contacts the top face of a support plate 108 as shown in drawing 11 in being the combination which the ink jet cartridge 16 and the ink jet recording apparatus mistook, carriage 107 cannot be equipped with the ink jet cartridge 16.

[0067] When the ink jet cartridge 16 is stuffed into carriage 107 by force, since the projection member 34 prepared in the rear face of the covering device material 30 before a support plate 108 is damaged since it is set up smaller than the disruptive strength of a support plate 108 is damaged and carriage 107 is equipped with the ink jet cartridge 16, the components by the side of an ink jet recording device should not damage the disruptive strength of the projection member 34. Moreover, a user can be made to recognize that it is incorrect wearing by a feel and an acoustic sense in case the projection member 34 is damaged. Although the projection member 34 of the ink jet cartridge 16 of this operation gestalt is formed so that it may damage by the load of about 5 kgf(s), it may change the disruptive strength of the projection member 34 according to amelioration of amelioration of the reinforcement of a support plate 108, a feel in case the projection member 34 is damaged, or an acoustic sense.

[0068] Moreover, when the ink jet recording apparatus and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 107 was equipped with the ink jet cartridge 16 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 16 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0069] In addition, even if it is the ink jet cartridge 16 damaged by incorrect wearing, a breakage is only the projection member 34, and since the ink jet recording head 17 or the ink jet unit 18 of the ink jet cartridge 16 are not influenced at all even if the projection member 34 is damaged, the function which the ink jet cartridge 16 has, i.e., the ink regurgitation function of the ink jet recording head 17, the ink hold function of the ink

tank 19, etc. are not spoiled. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16, it can be used that there is no trouble in any way.

[0070] As mentioned above, the projection member 34 as an incorrect wearing prevention means is formed in the ink jet cartridge 16, and since the projection member 34 is damaged before destroying an ink jet recording apparatus side even if it is the case where it equips with the ink jet cartridge 16 of the combination which was mistaken in the ink jet recording apparatus by force, an ink jet recording apparatus is not damaged.

[0071] Moreover, the projection member 34 can be used that there is no trouble in any way, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16 even when it has been made to incorrect-equip with the ink jet cartridge 16 once since it is prepared in the part which does not affect the essential record function of the ink jet cartridge 16 even if the projection member 34 is damaged.

[0072] Next, the application of the ink jet cartridge of this operation gestalt is shown in drawing 12 and drawing 13. The perspective view showing the application of the ink jet cartridge which showed drawing 12 to drawing 6 from drawing 2, and drawing 13 are the perspective views showing the rear face of covering device material shown in drawing 12.

[0073] As shown in drawing 12 and drawing 13, in the ink jet cartridge 116 of this application, the projection member 134 is formed in the covering device material 130 as an outer wall member in the shape of a rectangular parallelepiped. The covering device material 130 is formed with Noryl resin, and, as for the magnitude of the projection member 134, this application is also formed in height of about 3mm, **** of 4mm, and die length of about 10mm. In addition, since each configuration of the ink jet cartridge 116 is the same as the ink jet cartridge 16 explained with reference to drawing 6 from drawing 2, detailed explanation is omitted.

[0074] Then, the process in which the carriage 207 of an ink jet recording apparatus is equipped with the ink jet cartridge 116 is explained. However, since it is the same as that of the case where the case where the ink jet cartridge 116 and an ink jet recording device are right combination is explained using drawing 8 and drawing 9, explanation is omitted.

[0075] Drawing 14 is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken. In addition, since the configuration of each part of carriage 207 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0076] Thus, since the projection member 134 of the ink jet cartridge 116 contacts the top face of a support plate 208 as explained using drawing 11 in being the combination which the ink jet cartridge 116 and the ink jet recording apparatus mistook, carriage 207 cannot be equipped with the ink jet cartridge 116.

[0077] When the ink jet cartridge 116 is stuffed into a support plate 208 by force, in the ink jet cartridge 116 of this application, the projection member 134 of the covering device material 130 is not damaged, but by the thermal melting start stage as a fixed means from which it can be desorbed, caulking immobilization of the welding section 132,133 which is fixing the covering device material 130 to the ink jet cartridge 116 should separate, and the covering device material 130 should be desorbed from the ink jet

cartridge 116. Since the disruptive strength of the welding section 132,133 of the covering device material 130 is set as reinforcement which is desorbed from the ink jet cartridge 116 before a support plate 208 is damaged, the components by the side of an ink jet recording device do not damage it. Thus, a user can be made to recognize clearly that it is incorrect wearing compared with the case where only the projection member which is a part of covering device material damaged and ****s, when the covering device material 130 ****s.

[0078] Drawing 15 is the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12 , and its A-A line sectional view. In the welding section 132,133 of the covering device material 130 in the ink jet cartridge 116, the welding pin 186 of a circular cross section as shown in drawing 15 is used. If the welding pin 186 of a circular cross section is crushed with heat, the perimeter of the welding pin 186 will weld to the pin hole 135 of the covering device material 130. However, when the perimeter of the welding pin 186 welds, the desorption reinforcement of the covering device material 130 becomes large, and when the ink jet recording apparatus of combination by which the ink jet cartridge 116 was mistaken is equipped, there is a possibility of damaging an ink jet recording apparatus, without the covering device material 130 ****ing. Then, a work which weakens intentionally reinforcement of the welding section of the covering device material 130 is carried out by making low welding temperature which melts the welding pin 186, or shortening welding time amount.

[0079] Moreover, when the ink jet recording apparatus is equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 207 was equipped with the ink jet cartridge 116 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 116 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0080] in addition, the function which the ink jet cartridge 116 has even if it is the ink jet cartridge 116 from which the covering device material 130 was desorbed by incorrect wearing, i.e., ink regurgitation machine ** of an ink jet recording head, -- the ink hold function of an ink tank etc. is not spoiled a little. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 116, it can be used that there is no trouble in any way.

[0081] As mentioned above, since the covering device material 130 as an outer wall member which is the outer wall of the ink jet cartridge 116 ****s before it destroys an ink jet recording apparatus side even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge 116 which is not right combination by force, an ink jet recording apparatus is not damaged. Furthermore, a user can be made to recognize clearly that it is incorrect wearing because the covering device material 130 which is some outer walls of the ink jet cartridge 116 ****s.

[0082] In addition, the fixed means of the covering device material 130 to the ink jet cartridge 116 is not restricted to the above-mentioned thermal melting start stage. For example, you may be an adhesion means to fix the welding pin 186 to the pin hole 135 of covering device material using the adhesives of optimum dose, and to fix the covering device material 130 to the ink jet cartridge 116. Moreover, you may be an attachment means to fix the covering device material 130 to the ink jet cartridge 116, by only a few's

forming the outer diameter of the welding pin 186 thickly rather than the pin hole 135, and making the welding pin 186 and the pin hole 135 attach. Furthermore, the front faces of the ink jet cartridge 116 and the covering device material 130 may be fixed using a thermal melting start stage or an adhesion means, without forming the welding pin 186 and the pin hole 135.

[0083] Next, the further application of the ink jet cartridge shown in drawing 15 is shown in drawing 16. Drawing 16 is the plan showing the covering device material and welding pin in the further application of the ink jet cartridge shown in drawing 15, and its A-A line sectional view.

[0084] As shown in drawing 16, the configuration of the welding pin 286 may be formed so that a cross section may become an abbreviation cross-joint form. By making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since the welding area of the pin hole 235 of the covering device material 230 and the welding pin 286 becomes small, the welding reinforcement of the welding section 232,233 becomes small, and the desorption reinforcement of the covering device material 230 can be stopped low. Even if it does not make strict welding conditions, such as welding temperature at the time of melting the welding pin 286, and welding time amount, by this, caulking immobilization of the covering device material 230 can be carried out with the value near desired desorption reinforcement at the ink jet cartridge 216.

[0085] Thus, by making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since dispersion in the desorption reinforcement of the covering device material 230 is suppressed, the covering device material 230 can be more certainly desorbed at the time of incorrect wearing of the ink jet cartridge 216.

[0086]

[Effect of the Invention] As explained above, the ink jet cartridge of this invention Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to an ink jet recording apparatus by interfering with some ink jet recording apparatus is established. The disruptive strength of an incorrect wearing prevention means Since it is set up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes, even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force, an ink jet recording apparatus is not damaged.

[0087] Moreover, an incorrect wearing prevention means can make a user recognize that it is incorrect wearing by a feel and an acoustic sense in case a projection member is damaged by being a projection member.

[0088] Furthermore, an incorrect wearing prevention means can make a user recognize clearly that it is incorrect wearing compared with the case where only a projection member damages and ****s, by setting up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes the disruptive strength of the fixed part of an outer wall member and an ink tank including the outer wall member fixed to the ink tank possible [desorption].

[0089] Moreover, even if an incorrect wearing prevention means is destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if an incorrect wearing prevention means is

destroyed, if the function which an ink jet cartridge has is not spoiled but the ink jet recording device of right combination is equipped with an ink jet cartridge, it can be used that there is no trouble in any way.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink jet cartridge with which the ink jet recording apparatus which breathes out ink and records an image on recorded media is equipped.

PRIOR ART

[Description of the Prior Art] With the recording device used as output units, such as a computer, and a word processor, a workstation, or the recording device used as an output means of a copying machine or facsimile, it is an image (an alphabetic character and a notation are included.). It is below the same. Based on the image information inputted into the recording device, it is recorded on recorded media including plastics sheet metal, such as a record form or an OHP sheet.

[0003] The so-called ink jet recording apparatus is in one of such the recording apparatus. An ink jet recording apparatus is a recording apparatus which breathes out ink to recorded media from the nozzle prepared in the ink jet recording head, and records an image on recorded media. Since it is that a highly precise image is recordable at high speed, that it is recordable on the regular paper by which special processing is not made, and a non impact type as an advantage of an ink jet recording device, it is known that the noise at the time of record is small, that it is easy to record a color picture using further multicolor ink, that the miniaturization of an ink jet recording head is easy, etc.

[0004] by the way, the thing of a configuration of that the ink tank was connected to the ink supply means to the ink jet recording head in an ink jet recording apparatus through the tube etc. at the ink jet recording head -- or there is a thing of various gestalten, such as a thing using the ink jet cartridge with which the ink jet recording head and the ink tank were united. Among those, for example it is carried in U.S. Pat. No. 4771295 (JP,63-84239,A) removable to a recording apparatus, and it is an exchangeable ink jet cartridge, and fills up with an ink absorber in an ink tank about an ink jet cartridge, and what is infiltrating ink into the ink absorber is indicated. In addition, such an ink jet cartridge is already marketed widely.

[0005] On the other hand, recently, the nozzle of an ink jet recording head is arranged more by high density, and record of a high definition image is attained. For example, the color picture record not only using alphabetic character record but the color ink only using black ink and record of a still high definition photograph tone image are also attained. The thing not only using what the class of ink used with a recording device was also becoming various in connection with this, for example, melted the color to the drainage system solvent about black ink but a pigment, the thing which has a water resisting property even if it is a color are used. About color ink, moreover, by making light concentration of each color of not only the ink of mere yellow, MAZENDA, and

cyanogen but ink Gradation nature is given to the lightness between the monochrome part in a record image, and the part which two or more colors piled up, and red, Green, and blue ink are also used for the ink of the yellow which can acquire more nearly high-definition record image quality, MAZENDA, and cyanogen, and a pan. The class of ink jet cartridge is increasing according to such a background, and the class of ink jet recording device is also increasing that it should correspond to each ink jet cartridge.

[0006] By the way, since many components are communalized in order that an ink jet cartridge and an ink jet recording device may aim at reduction of a production cost, and compaction of a development cycle, the configuration is similar for various kinds. Then, an ink jet recording apparatus and it can be equipped, and user support is performed by explanation at a shop front, and a catalog and an operation manual about combination with an ink jet cartridge recordable good. However, there is not no possibility that a user will equip with the ink jet cartridge which does not support an ink jet recording apparatus accidentally. When equipped with the ink jet cartridge which does not support an ink jet recording apparatus, since drive conditions differ, in the printer driver with which the ink jet recording apparatus is equipped, the case where record is not carried out at all by the difference in the discharge quantity of an ink class or ink, the difference in a nozzle consistency, etc., or a normal image is not recorded may be generated.

[0007] Then, in order to prevent such a situation, at least one side of an ink jet recording apparatus and an ink jet cartridge is equipped with the discernment means for identifying whether it is incorrect wearing. While preparing heights in an electric discernment means identify incorrect wearing by reading with a signal reading means to by_which the recognition signal given to the ink-jet cartridge is established as a discernment means at the ink-jet recording device side, and an ink-jet cartridge, in an ink-jet recording device, the crevice into which the heights of an ink-jet cartridge fit establishes, and there is a structural discernment means identify incorrect wearing in it, in the mistaken combination by being unable to equip an ink-jet recording device with an ink-jet cartridge, and carrying out it.

[0008] Among the above-mentioned discernment means, with an electric discernment means, after being equipped with an ink jet cartridge, it is identified whether it was incorrect wearing. However, the delivery side of the nozzle of an ink jet cartridge is protected to an ink jet recording apparatus, or the capping means for attracting ink is formed in it from the nozzle, and the ink of an ink jet cartridge with which the ink jet recording apparatus was equipped before remains in this capping means somewhat. Therefore, if a KYAPINGU means contacts the nozzle of the ink jet cartridge with which it was newly equipped, heterogeneous ink will be mixed on the front face of a nozzle and a capping means. thus, the cause of fixing of ink being promoted if heterogeneous ink is mixed -- especially, with the nozzle of an ink jet recording head, since ink is not normally breathed out until the ink which fixed after starting record is removed, the recorded image may become blurred When fixing of ink progresses further, the nozzle of an ink jet recording head is got blocked, or it is considered that a capping means also stops functioning normally.

[0009] On the other hand, among the above-mentioned discernment means, with the structural discernment means, only when the heights prepared in the ink jet cartridge and the crevice established in the ink jet recording apparatus are the cases where an ink jet cartridge and a recording apparatus are right combination, it is prepared so that it can fit

in and equip. Thereby, since incorrect wearing of an ink jet cartridge can be prevented beforehand, heterogeneous ink is not mixed as mentioned above.

[0010] So, the above-mentioned structural discernment means is widely used for the discernment means of incorrect wearing of an ink jet cartridge.

EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, the ink jet cartridge of this invention Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to an ink jet recording apparatus by interfering with some ink jet recording apparatus is established. The disruptive strength of an incorrect wearing prevention means Since it is set up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes, even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force, an ink jet recording apparatus is not damaged.

[0087] Moreover, an incorrect wearing prevention means can make a user recognize that it is incorrect wearing by a feel and an acoustic sense in case a projection member is damaged by being a projection member.

[0088] Furthermore, an incorrect wearing prevention means can make a user recognize clearly that it is incorrect wearing compared with the case where only a projection member damages and ****s, by setting up smaller than the disruptive strength of the member in which an incorrect wearing prevention means interferes the disruptive strength of the fixed part of an outer wall member and an ink tank including the outer wall member fixed to the ink tank possible [desorption].

[0089] Moreover, even if an incorrect wearing prevention means is destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if an incorrect wearing prevention means is destroyed, if the function which an ink jet cartridge has is not spoiled but the ink jet recording device of right combination is equipped with an ink jet cartridge, it can be used that there is no trouble in any way.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the case where the above-mentioned structural discernment means is used, in spite of being the combination which the ink jet recording apparatus and the ink jet cartridge mistook, when unreasonableness has been equipped with the ink jet cartridge, with a user not noticed, at least one side will be damaged among an ink jet recording apparatus and an ink jet cartridge. When an ink jet cartridge side is damaged, if the ink jet cartridge of another normal is prepared, it can record immediately. However, when an ink jet recording apparatus side is damaged, it will be necessary to fix an ink jet recording apparatus, the burden which a user receives since it becomes impossible to use an ink jet recording apparatus is large during a repair period, and the breakage by the side of an ink jet recording apparatus is not desirable.

[0012] Then, this invention aims at offering the ink jet cartridge which has the incorrect wearing prevention means which does not damage an ink jet recording apparatus even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge which is not right combination by force.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the ink jet cartridge of this invention The ink jet recording head section which breathes out ink and records on recorded media, It is the ink jet cartridge by which the ink tank which holds the ink supplied to said ink jet recording head section is united, is constituted, and an ink jet recording apparatus is equipped with it. Even if it equips, when it is going to equip the ink jet recording device which cannot be used An incorrect wearing prevention means to prevent incorrect wearing to said ink jet recording apparatus by interfering with said some of ink jet recording apparatus is established. The disruptive strength of said incorrect wearing prevention means It is set up smaller than the disruptive strength of the member of the ink jet recording device in which said incorrect wearing prevention means interferes.

[0014] Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force by this, before the part in which an incorrect wearing prevention means interferes among the members in an ink jet recording apparatus is damaged, the incorrect wearing prevention means of an ink jet cartridge is damaged.

[0015] Moreover, when said incorrect wearing prevention means is a projection member, it is recognized by the user by a feel and an acoustic sense in case a projection member is damaged that it is incorrect wearing.

[0016] Furthermore, said incorrect wearing prevention means contains the outer wall member fixed to said ink tank possible [desorption]. By setting up smaller than the disruptive strength of the member in which said incorrect wearing prevention means interferes the disruptive strength of the fixed part of said outer wall member and said ink tank Even if it should equip, when the ink jet recording apparatus which cannot be used is equipped with an ink jet cartridge by force, an outer wall member is desorbed from an ink tank. Therefore, compared with the case where only a projection damages and ****s, it is clearly recognized by the user that it is incorrect wearing.

[0017] In addition, as for said outer wall member, it is desirable to be fixed to said ink tank by the thermal melting start stage, the adhesion means, or the attachment means.

[0018] Moreover, even if said incorrect wearing prevention means is the ink jet cartridge by which the incorrect wearing prevention means was destroyed by incorrect wearing by being arranged in the location which does not spoil the function which said ink jet cartridge has even if destroyed, the function which an ink jet cartridge has is not spoiled.

[0019]

[Embodiment of the Invention] Next, the operation gestalt of this invention is explained with reference to a drawing.

[0020] The outline of 1 operation gestalt of an ink jet recording device in which first use drawing 1 and the ink jet cartridge of this invention is used is explained. Drawing 1 is the

perspective view showing the outline configuration of 1 operation gestalt of the ink jet recording device with which the ink jet cartridge of this invention is used.

[0021] As shown in drawing 1, the leading screw 2 by which spiral slot 2a was minced is supported by the ink jet recording device 1 free [rotation]. Through the driving force transfer gear 6 prepared in the leading screw 2, and the driving force transfer gear 5 which is bit and put together and is prepared in the driving force transfer gear 6, a leading screw 2 is interlocked with the forward inverse rotation of a drive motor 4, and is rotated. Moreover, the pin (un-illustrating) prepared in the part which supports a leading screw 2 engages with spiral slot 2a, and the carriage 7 with which the ink jet cartridge 16 is carried is formed free [sliding] to the leading screw 2 and the guide rail 3. Since the forward inverse rotation of a drive motor 4 is interlocked with and a pin is guided to spiral slot 2a by this, carriage 7 moves in accordance with the shaft orientations (X shaft orientations of illustration) of a platen roller 11. Paper feed of the recorded media 10, such as a record form and plastics sheet metal, is carried out by the platen roller 11. In addition, in the range which meets the ink jet recording head (un-illustrating) of the ink jet cartridge 16 among the front faces of recorded media 10, it is formed more broadly than a platen roller 11, and recorded media 10 are pressed by the peripheral surface of a platen roller 11 with the paper bail plate 12 formed along the migration direction of carriage 7.

[0022] Moreover, the ink jet recording apparatus 1 is equipped with photo couplers 13 and 14 as a home-position detection means for detecting passage of the lever 15 prepared in carriage 7, and performing the change of the hand of cut of a drive motor 4 etc. Furthermore, in the location (for example, home position) from which the ink jet recording head of the ink jet cartridge 16 separated from the record section, the capping means 20 of a wrap (capping) sake is arranged in the location which meets an ink jet recording head in the ink delivery side of an ink jet recording head. The KYAPINGU means 20 is supported by the supporter material 21, it has a suction means 22 to attract ink from the ink delivery of an ink jet recording head further, and suction recovery of an ink jet recording head is performed by attracting the ink delivery of an ink jet recording head through the opening 23 in a cap.

[0023] The cleaning blade 26 which the support plate material 25 is attached and was supported by the support plate material 25 possible [sliding] is formed in Y shaft orientations of illustration movable by the driving means (un-illustrating), and cleaning of an ink jet recording head is performed in the frame part material 24 of the ink jet recording device 1 by contacting and estranging to an ink jet recording head.

[0024] The cam 28 is formed in the location which contacts when it moves to a location with carriage 7. The lever 27 is formed so that it may interlock and may carry out movable to the cam 28 moved to carriage 7. In connection with a motion of a lever 27, transfer of the driving force from a drive motor 4 is controlled by controlling the power means of communication of common knowledge, such as a gear 29 and a clutch (un-illustrating).

[0025] When carriage 7 moves to a home-position field, alignment of each processing stroke of the above-mentioned capping, suction recovery, and cleaning is carried out to the location where an ink jet recording head meets the opening 23 in a cap, or a cleaning blade 26, and it is performed. These each processing stroke and alignment strokes of an ink jet recording head can be performed in the mode of arbitration using well-known

timing and a well-known sequence. Moreover, each of these processing strokes may be performed independently and may be performed complexly.

[0026] In addition, the ink jet recording apparatus 1 may be equipped with an electric discernment means to identify incorrect wearing, by reading with a signal reading means by which the recognition signal given to the ink jet cartridge 16 is established at the ink jet recording apparatus 1 side.

[0027] Next, the configuration of 1 operation gestalt of the ink jet cartridge of this invention is explained. The perspective view in which drawing 2 shows the whole 1 operation gestalt configuration of the ink jet cartridge of this invention, the fluoroscopy perspective view of the ink jet recording head in the ink jet cartridge which showed drawing 3 to drawing 2 , and drawing 4 R> 4 are the decomposition perspective views of the ink jet cartridge shown in drawing 2 .

[0028] As shown in drawing 2 and drawing 4 , the ink jet cartridge 16 has the structure where the ink jet unit 18 equipped with the ink jet recording head 17 and the ink tank 19 which holds ink were attached to one.

[0029] The perspective view shown where drawing 5 is seen from [which showed the ink jet cartridge shown in drawing 2 to drawing 2] A, and drawing 6 are the perspective views showing the rear face of covering device material shown in drawing 5 .

[0030] As shown in drawing 5 , the covering device material 30 forms the enclosure 31 which surrounds and contains the ink jet unit 18 between the ink tanks 19 while being some outer walls of the ink jet cartridge 16. Moreover, the claw part 36 which engages with hook 9a (refer to drawing 8) of the carriage 7 mentioned later is formed in the ink jet cartridge 16. The covering device material 30 is being fixed to the ink tank 19 in the two welding sections 32 and 33. In addition, as shown in drawing 5 and drawing 6 , the projection member 34 as an incorrect wearing prevention means to prevent incorrect wearing to the mistaken ink jet recording device of combination is formed in the rear face of the covering device material 30. Moreover, as shown in drawing 6 , the pin hole 35 is formed in the welding sections 32 and 33 at the covering device material 30. Two welding pins (un-illustrating) prepared in the ink tank 19 are inserted in two pin holes 35 of the covering device material 30, respectively, and caulking immobilization of the covering device material 30 is carried out to the ink tank 19 by crushing the head of a welding pin by heat. With this operation gestalt, the covering device material 30 is formed with Noryl resin, and the magnitude of the projection member 34 is formed in about 0.5mm in height of about 3mm, 4mm of ****, and thickness. In addition, the molding material of the covering device material 30, the configuration of the projection member 34, and a dimension are not limited above.

[0031] Then, the configuration of the ink jet recording head 17 is explained.

[0032] As shown in drawing 3 , two or more deliveries 37 are established in seriate, and the liquid ink way 39 for supplying ink is arranged in each delivery 37 by the ink jet recording head 17. The electric thermal-conversion object 38 which generates heat energy with the supplied applied voltage as an energy component for making ink breathe out from a delivery 37 is arranged in each liquid ink way 39. By impressing a driving signal to each electric thermal-conversion object 38 alternatively according to a picture signal, ink is made to produce film boiling with the heat energy generated from the electric thermal-conversion object 38, and air bubbles are generated in the liquid ink way 39. By growing up these air bubbles further, an ink droplet is breathed out from a

delivery 37.

[0033] In addition, each electric thermal-conversion object 38 is established on the heater board 40 which consists of a silicon substrate, and is formed in one by the membrane formation technique by semi-conductor manufacture processes, such as etching, vacuum evaporation, and sputtering, with wiring and the electrode (un-illustrating) of the aluminum which supplies power to each electric thermal-conversion object 38. A delivery 37 can manufacture easily by this the ink jet recording head 17 arranged by high density, and much more miniaturization of the ink jet recording head 17 can be attained. Moreover, by utilizing the advantage of IC technique or a micro processing technique, long-picture-izing of the ink jet recording head 17 and shape[of a field]-izing (two-dimensional-izing) are also easy, and the formation of full multi and high-density-assembly-izing of the ink jet recording head 17 are also still easier.

[0034] Moreover, the top plate 42 with which the common liquid room 41 which contains temporarily the septum for classifying each liquid ink way 39 and the ink supplied to each liquid ink way 39, the ink receiving window 43 (refer to drawing 4) for introducing ink into the common liquid room 41 from the ink tank 19, etc. were formed is really fabricated. As a molding material of a top plate 42, although polysulfone is desirable, other molding resin ingredients, such as polyether sulfone, polyphenylene oxide, and polypropylene, may be used.

[0035] Next, the configuration of the ink jet unit 18 is explained.

[0036] As shown in drawing 4 , the metal base material 45 has the holes 50, 51, and 52 which engage with two projections 47a and 47b for positioning prepared in the ink tank 19, and two projections 48 and 49 (projection 49 is referring to drawing 7) for thermal melting arrival maintenance, and also has the projections 53 and 54 for positioning to carriage 7. In addition, a base material 45 is made to penetrate the ink supply pipe 55 mentioned later, and the hole 56 for forming the ink passage from the ink tank 19 is formed. in addition, near the projections 53 and 54 for positioning of a base material 45 Crevices 57 and 58 are formed, respectively. Crevices 57 and 58 In the assembled ink jet cartridge 16 (refer to drawing 2) By being located on the production of the parallel slots 59 and 60 of each plurality formed in three sides around the ink jet unit 18 in the ink jet cartridge 16, it is constituted so that discard, such as dust and ink, may not result in projections 53 and 54.

[0037] The wiring substrate 46 is stuck on the base material 45 by the binder etc. Two or more pads 61 for receiving the electrical signal from the ink jet recording device 1 are formed in the end of the wiring substrate 46, and the wiring part of the heater board 40 which is also the substrate of the ink jet recording head 17 is connected to the other end. Each pad 61 supports each electric thermal-conversion object 38 (refer to drawing 3) prepared in the ink jet recording head 17, and the electrical signal from the ink jet recording device 1 passes along each pad 61, and is supplied to each electric thermal-conversion object 38 according to an individual.

[0038] The pressure spring 62 for fixing the ink jet recording head 17 to a base material 45 is formed in the M character configuration. The heater board 40 and the top plate 42 are arranged between the pressure spring 62 and the base material 45, and the heater board 40 and a top plate 42 are fixed in the condition of having been put between the pressure spring 62 and the base material 45, by making the foot of a pressure spring 62 engage with the rear-face side of a base material 45 through the hole 63 of a base material

45. while the part of the outer wall of the common liquid room 41 (refer to drawing 3) is pressed by the center section of the shape of an M typeface of a pressure spring 62 by light pressure among the outer walls of a top plate 42 at this time -- a pressure spring 62 - front -- the who section 64 -- a part of liquid ink way 39 (refer to drawing 3) of the ink jet recording head 17 -- the intensive press of the about 37-delivery field is preferably carried out with the linear pressure.

[0039] the ink which the ink supply pipe 55 is formed in the ink feed zone material 65 for supplying the ink supplied from the ink tank 19 to the ink jet recording head 17 in the shape of a cantilever, and was connected with the ink supply pipe 55 -- a conduit 66 has - having -- further -- ink -- the closure pin 67 for securing the capillarity between a conduit 66 and the ink supply pipe 55 is inserted. In addition, the closure of the bond part of the ink tank 19 and the ink supply pipe 55 is carried out by press fit.

[0040] Since the ink feed zone material 65 is really fabricated by mold shaping, its dimensional accuracy of each part is high. for example, ink -- since the dimensional accuracy of each part of the ink feed zone material 65 is high, the pressure-welding condition over the ink receiving window 43 of a conduit 66 is stable. here -- ink -- if the adhesives for closure resin are slushed from the ink feed zone material 65 side where the pressure welding of the conduit 66 is carried out to the ink receiving window 43 -- ink -- the more positive free passage condition of a conduit 66 and the ink receiving window 43 can be acquired. Moreover, immobilization of the ink feed zone material 65 to a base material 45 is simply performed by making the holes 68 and 69 of a base material 45 penetrate two pins (un-illustrating) currently formed in the ink feed zone material 65, and carrying out thermal melting arrival of the pin. In addition, few lobes produced in the ink tank 19 side of a base material 45 are stored by having carried out thermal melting arrival of the pin in the hollow (un-illustrating) formed in the side face of the anchoring section of the ink jet unit 18 among the front faces of the ink tank 19. Therefore, trouble is not caused to positioning at the time of attaching the ink jet unit 18 in the ink tank 19.

[0041] Next, the configuration of the ink tank 19 is explained.

[0042] As shown in drawing 4 , the ink tank 19 is assembled by closing the ink absorber 71 with the tank lid 72, after consisting of a cartridge body 70, an ink absorber 71 which sinks in and holds ink, and a tank lid 72 and inserting the ink absorber 71 from the opposite side by the side of ink jet unit anchoring section 19a. The ink feed hopper 73 prepared in ink jet unit anchoring section 19a of the ink tank 19 is for supplying ink to the ink jet unit 18, and the filter (un-illustrating) is prepared in the interior of the ink feed hopper 73. Moreover, the atmospheric-air free passage opening 74 for making atmospheric air open the interior for free passage is formed in the ink tank 19, and ***** 75 which prevents that ink is revealed from the atmospheric-air free passage opening 74 is being further inserted and fixed to the atmospheric-air free passage opening 74.

[0043] The configuration of ink jet unit anchoring section 19a of the ink tank 19 is explained using drawing 7 and drawing 4 . Drawing 7 is the perspective view showing ink jet unit anchoring section 19a in the ink tank 19 shown in drawing 4 .

[0044] As shown in drawing 7 and drawing 4 , it sets to ink jet unit anchoring section 19a of the ink tank 19. the delivery 37 of the delivery plate 44 fabricated by the front face of a top plate 42 at one -- almost -- a core -- a passage -- the ink tank 19, if a straight line parallel to the datum level of base 19b is set to L1 On the straight line L1, two projections

47a and 47b which engage with two holes 50 currently formed in the base material 45 are formed. Projections 47a and 47b position the base material 45 to ink jet unit anchoring section 19a, and the height of Projections 47a and 47b is slightly formed low rather than base material 45 thickness.

[0045] Moreover, projections 48 and 49 are formed in ink jet unit anchoring section 19a. Projections 48 and 49 correspond to the holes 51 and 52 for immobilization to ink jet unit anchoring section 19a currently formed in the base material 45, are formed for a long time than Projections 47a and 47b, and fix a base material 45 to ink jet unit anchoring section 19a by carrying out thermal melting arrival of the part which penetrated and projected the base material 45.

[0046] On the straight line L3, if it is perpendicular to a straight line L1 and the line which passes along L3 and projection 49 the straight line which passes along projection 48 is set to L2, since a core is located mostly, the free passage condition of the ink feed hopper 73 and the ink supply pipe 55 is stabilized, and a possibility of the ink feed hopper 73 that a free passage condition may be spoiled by impacts, such as fall of the ink jet cartridge 16, is mitigated. Moreover, since a straight line L2 and a straight line L3 are not in agreement and projections 48 and 49 exist around projection 47a, improvement of the positioning accuracy of the ink jet recording head 17 to ink jet unit anchoring section 19a is achieved. In addition, a curve L4 is the outer wall location of the ink feed zone material 65 when ink jet unit anchoring section 19a is equipped with the ink jet unit 18. The fixed condition is stable and the fixed position of the ink feed zone material 65 seems not to shift easily, since the ink feed zone material 65 is fixed to the location which met mostly the projections 48 and 49 which are fixed parts in this way although weight is concentrating the ink jet unit 18 on the part in which the ink feed zone material 65 is formed.

[0047] Furthermore, the flange 76 prepared in the ink tank 19 is inserted in flange slot 7b (refer to drawing 8) currently formed in carriage 7, and it is prevented that the posture of the ink jet cartridge 16 over carriage 7 gets extremely bad. Moreover, even if the external force which makes the ink jet cartridge 16 secede from carriage 7 according to a certain cause by engaging with the hook section (un-illustrating) which is prepared in ink jet unit anchoring section 19a of the ink tank 19, from which it escapes, and by which the stop 87 is formed in carriage 7 acts, the wearing condition of the ink jet cartridge 16 is maintained.

[0048] As shown in drawing 5 , the ink tank 19 is constituted by covering ink jet unit anchoring section 19a by the covering device material 30 so that the ink jet unit 18 may be surrounded except for lower part opening 16a, after being equipped with the ink jet unit 18. However, since lower part opening 16a is closed by the front face of carriage 7 when the ink jet cartridge 16 is carried in carriage 7, the enclosure 31 which surrounds the ink jet unit 18 depending on the methods of four substantially will be formed. Therefore, generation of heat from the ink jet unit 18 established in this enclosure 31 is effective as what distributes to homogeneity and keeps the inside of this space warm in this enclosure 31. However, when the ink jet recording device 1 uses it, having carried out long duration continuation, few temperature ups may be produced in an enclosure 31. For this reason, equalization of the temperature distribution of the ink jet unit 18 whole is realized, without being influenced by the external environment, forming the slit 78 of width of face smaller than this enclosure 31 in the roof section 77 of the ink tank 19, and

preventing the temperature up in an enclosure 31, as shown in drawing 2, in order to help the natural heat dissipation from the ink jet unit 18.

[0049] As shown in drawing 4, inside the ink jet cartridge 16 Ink the hole 56 of the ink feed hopper 73 and a base material 45 from the interior of the cartridge body 70 A passage, After being supplied in the ink feed zone material 65 through the inlet established in the inside rear-face side of the ink feed zone material 65 and passing along the interior of the ink feed zone material 65, it flows into the common liquid room 41 (refer to drawing 3) through the ink receiving window 43 of a top plate 42. The closure members 79 which consist of silicon, isobutylene isoprene rubber, etc., such as packing and an O ring, are arranged, the closure is performed in the connection of the supply way of the above ink by this, and an ink supply way is secured to it.

[0050] As mentioned above, respectively, since the ink feed zone material 65, a top plate 42, and the cartridge bodies 70 are really shaping components, they are cheap and are very effective in upgrading of not only being formed highly but mass production method.

[of dimensional accuracy] Moreover, since components mark are decreasing compared with the former, the outstanding property [exhausting] can be demonstrated certainly.

[0051] As return and the assembled ink jet cartridge 16 are shown at drawing 2, the clearance 81 is formed at explanation of the ink jet cartridge 16 whole between the top-face section 80 of the ink feed zone material 65, and the edge of the roof section 77 in which the slit 78 of the ink tank 19 was formed. Similarly, the clearance (un-illustrating) is formed also between the inferior-surface-of-tongue section 82 (refer to drawing 4) of the ink feed zone material 65, and the sheet metal member 83 (refer to drawing 7) prepared in the lower part of ink jet unit anchoring section 19a of the ink tank 19. These clearances have prevented that external force carries out a direct action to the ink jet unit 18 by absorbing the unnecessary external force which acts on the ink jet cartridge 16 while assisting the heat dissipation effectiveness in a slit 78.

[0052] Next, the configuration of the carriage 7 in the ink jet recording apparatus 1 of this operation gestalt is explained. Drawing 8 R> 8 is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1.

[0053] As explained using drawing 1, carriage 7 moves in accordance with the shaft orientations of a platen roller 11. As shown in drawing 8, dark room 7a is prepared in the part which counters a platen roller 11 (refer to drawing 1) at carriage 7. Flange slot 7b in which the flange 76 (reference, such as drawing 2) prepared in the outer wall of the ink jet cartridge 16 is inserted is formed in dark room 7a.

[0054] Moreover, the support plate 8 for electrical connection is formed in carriage 7. The flexible sheet 85 which has the pad 84 corresponding to the pad 61 of the wiring substrate 46 is formed in the field which meets the wiring substrate 46 when equipped with the ink jet cartridge 16 among the front faces of a support plate 8. In addition, the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background. On the other hand, when equipped with the ink jet cartridge 16 among the front faces of a support plate 8, notch 8a for avoiding interference with the projection member 34 is formed in the part along which the projection member 34 prepared in the covering device material 30 of the ink jet cartridge 16 passes.

[0055] Furthermore, carriage 7 is equipped with hook 9a for fixing the ink jet cartridge

16. Hook 9a is prepared free [rotation] to fixed shaft 9c prepared in the hook susceptor 9 for supporting hook 9a, and hook side 9b which engages with the claw part 36 of the ink jet cartridge 16 is formed at the tip of hook 9a.

[0056] Next, the process in which the carriage of an ink jet recording apparatus is equipped with an ink jet cartridge is explained.

[0057] First, the case where an ink jet cartridge and an ink jet recording device are right combination is explained using drawing 8 and drawing 9 . Here, when an ink jet cartridge and an ink jet recording apparatus are right combination, the case where the ink jet recording apparatus 1 and the ink jet cartridge 16 which were explained above are combined is said.

[0058] Drawing 9 is the plan showing the condition of equipping the carriage in the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 . In addition, in drawing 9 , only the support plate 8 of the ink jet cartridge 16 and carriage 7 is shown, and the roof section 77 (refer to drawing 2) of an ink tank omits, and is drawn.

[0059] As shown in drawing 8 , the field which has lower part opening 16a of the ink jet cartridge 16 is made to meet the front face of carriage 7, and lower part opening 16a is inserted in the support plate 8 of carriage 7. Since notch 8a is prepared in the support plate 8 as shown in drawing 8 and drawing 9 , a support plate 8 does not interfere in the projection member 34 prepared in the ink jet cartridge 16, and carriage 7 is normally equipped with the ink jet cartridge 16.

[0060] If carriage 7 is equipped with the ink jet cartridge 16 and the base of the ink jet cartridge 16 touches the front face of carriage 7, the flange 76 of the ink jet cartridge 16 will be inserted in flange slot 7b currently formed in dark room 7a of carriage 7.

Subsequently, when hook 9a with which carriage 7 is equipped is rotated and hook side 9b is made to engage with the claw part 36 of the ink jet cartridge 16, the ink jet cartridge 16 is fixed to carriage 7.

[0061] Since the pressure welding of the wiring substrate 46 of the ink jet cartridge 16 is carried out to the flexible sheet 85 of a support plate 8 at this time, the pad 84 of the flexible sheet 85 and the pad 61 of the wiring substrate 46 will be contacted. Thereby, a record signal comes to be transmitted to the ink jet cartridge 16 from the ink jet recording apparatus 1. In addition, since the rear face of the flexible sheet 85 is equipped with the rubber slab sheet (un-illustrating) which has the heights which press each pad 84 from a background, the increase of the contact pressure between each pad 61 and 84 and a contact condition are stable.

[0062] In addition, when the ink jet recording apparatus 1 and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which the display panel (un-illustrating) of the ink jet recording apparatus 1 was correctly equipped with the ink jet cartridge is indicated.

[0063] Next, the case where it is the combination which the ink jet cartridge and the ink jet recording device mistook is explained using drawing 10 and drawing 11 . Here, the case where it is the mistaken combination means the case where an ink jet cartridge and the ink jet recording device which cannot be used even if it equips with the ink jet cartridge are put together.

[0064] The perspective view showing the condition of equipping with drawing 10 the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge

shown in drawing 2 was mistaken, and drawing 11 are the plans showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 R> 2 was mistaken. In addition, in drawing 11, only the support plate 108 of the ink jet cartridge 16 and carriage 107 is shown, and the roof section 77 (refer to drawing 2) of the ink tank 19 omits, and is drawn.

[0065] As shown in drawing 10 and drawing 11, the notch for preventing interference with the projection member 34 of the ink jet cartridge 16 is not prepared in the support plate 108 in the mistaken ink jet recording apparatus of combination. In addition, the disruptive strength of the projection member 34 is set up smaller than the disruptive strength of a support plate 108. In addition, since each part of carriage 107 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0066] Thus, since the projection member 34 of the ink jet cartridge 16 contacts the top face of a support plate 108 as shown in drawing 11 in being the combination which the ink jet cartridge 16 and the ink jet recording apparatus mistook, carriage 107 cannot be equipped with the ink jet cartridge 16.

[0067] When the ink jet cartridge 16 is stuffed into carriage 107 by force, since the projection member 34 prepared in the rear face of the covering device material 30 before a support plate 108 is damaged since it is set up smaller than the disruptive strength of a support plate 108 is damaged and carriage 107 is equipped with the ink jet cartridge 16, the components by the side of an ink jet recording device should not damage the disruptive strength of the projection member 34. Moreover, a user can be made to recognize that it is incorrect wearing by a feel and an acoustic sense in case the projection member 34 is damaged. Although the projection member 34 of the ink jet cartridge 16 of this operation gestalt is formed so that it may damage by the load of about 5 kgf(s), it may change the disruptive strength of the projection member 34 according to amelioration of amelioration of the reinforcement of a support plate 108, a feel in case the projection member 34 is damaged, or an acoustic sense.

[0068] Moreover, when the ink jet recording apparatus and the ink jet cartridge 16 are equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 107 was equipped with the ink jet cartridge 16 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 16 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0069] In addition, even if it is the ink jet cartridge 16 damaged by incorrect wearing, a breakage is only the projection member 34, and since the ink jet recording head 17 or the ink jet unit 18 of the ink jet cartridge 16 are not influenced at all even if the projection member 34 is damaged, the function which the ink jet cartridge 16 has, i.e., the ink regurgitation function of the ink jet recording head 17, the ink hold function of the ink tank 19, etc. are not spoiled. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16, it can be used that there is no trouble in any way.

[0070] As mentioned above, the projection member 34 as an incorrect wearing prevention means is formed in the ink jet cartridge 16, and since the projection member 34 is damaged before destroying an ink jet recording apparatus side even if it is the case where it equips with the ink jet cartridge 16 of the combination which was mistaken in

the ink jet recording apparatus by force, an ink jet recording apparatus is not damaged. [0071] Moreover, the projection member 34 can be used that there is no trouble in any way, if the ink jet recording device of right combination is equipped with the ink jet cartridge 16 even when it has been made to incorrect-equip with the ink jet cartridge 16 once since it is prepared in the part which does not affect the essential record function of the ink jet cartridge 16 even if the projection member 34 is damaged.

[0072] Next, the application of the ink jet cartridge of this operation gestalt is shown in drawing 12 and drawing 13. The perspective view showing the application of the ink jet cartridge which showed drawing 12 to drawing 6 from drawing 2, and drawing 13 are the perspective views showing the rear face of covering device material shown in drawing 12.

[0073] As shown in drawing 12 and drawing 13, in the ink jet cartridge 116 of this application, the projection member 134 is formed in the covering device material 130 as an outer wall member in the shape of a rectangular parallelepiped. The covering device material 130 is formed with Noryl resin, and, as for the magnitude of the projection member 134, this application is also formed in height of about 3mm, **** of 4mm, and die length of about 10mm. In addition, since each configuration of the ink jet cartridge 116 is the same as the ink jet cartridge 16 explained with reference to drawing 6 from drawing 2, detailed explanation is omitted.

[0074] Then, the process in which the carriage 207 of an ink jet recording apparatus is equipped with the ink jet cartridge 116 is explained. However, since it is the same as that of the case where the case where the ink jet cartridge 116 and an ink jet recording device are right combination is explained using drawing 8 and drawing 9, explanation is omitted.

[0075] Drawing 14 is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken. In addition, since the configuration of each part of carriage 207 is the same as the carriage 7 shown in drawing 8, detailed explanation is omitted.

[0076] Thus, since the projection member 134 of the ink jet cartridge 116 contacts the top face of a support plate 208 as explained using drawing 11 in being the combination which the ink jet cartridge 116 and the ink jet recording apparatus mistook, carriage 207 cannot be equipped with the ink jet cartridge 116.

[0077] When the ink jet cartridge 116 is stuffed into a support plate 208 by force, in the ink jet cartridge 116 of this application, the projection member 134 of the covering device material 130 is not damaged, but by the thermal melting start stage as a fixed means from which it can be desorbed, caulking immobilization of the welding section 132,133 which is fixing the covering device material 130 to the ink jet cartridge 116 should separate, and the covering device material 130 should be desorbed from the ink jet cartridge 116. Since the disruptive strength of the welding section 132,133 of the covering device material 130 is set as reinforcement which is desorbed from the ink jet cartridge 116 before a support plate 208 is damaged, the components by the side of an ink jet recording device do not damage it. Thus, a user can be made to recognize clearly that it is incorrect wearing compared with the case where only the projection member which is a part of covering device material damaged and ****s, when the covering device material 130 ****s.

[0078] Drawing 15 is the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12 , and its A-A line sectional view. In the welding section 132,133 of the covering device material 130 in the ink jet cartridge 116, the welding pin 186 of a circular cross section as shown in drawing 15 is used. If the welding pin 186 of a circular cross section is crushed with heat, the perimeter of the welding pin 186 will weld to the pin hole 135 of the covering device material 130. However, when the perimeter of the welding pin 186 welds, the desorption reinforcement of the covering device material 130 becomes large, and when the ink jet recording apparatus of combination by which the ink jet cartridge 116 was mistaken is equipped, there is a possibility of damaging an ink jet recording apparatus, without the covering device material 130 ****ing. Then, a work which weakens intentionally reinforcement of the welding section of the covering device material 130 is carried out by making low welding temperature which melts the welding pin 186, or shortening welding time amount.

[0079] Moreover, when the ink jet recording apparatus is equipped with an electric discernment means to identify incorrect wearing of an ink jet cartridge, the purport by which carriage 207 was equipped with the ink jet cartridge 116 of the mistaken combination is indicated to the display panel (un-illustrating) of an ink jet recording apparatus. Therefore, although it is after wearing even when it equips with the ink jet cartridge 116 and a user has not recognized that it is incorrect wearing, it can know that it is incorrect wearing.

[0080] in addition, the function which the ink jet cartridge 116 has even if it is the ink jet cartridge 116 from which the covering device material 130 was desorbed by incorrect wearing, i.e., ink regurgitation machine ** of an ink jet recording head, -- the ink hold function of an ink tank etc. is not spoiled a little. Therefore, if the ink jet recording device of right combination is equipped with the ink jet cartridge 116, it can be used that there is no trouble in any way.

[0081] As mentioned above, since the covering device material 130 as an outer wall member which is the outer wall of the ink jet cartridge 116 ****s before it destroys an ink jet recording apparatus side even if it is the case where an ink jet recording apparatus is equipped with the ink jet cartridge 116 which is not right combination by force, an ink jet recording apparatus is not damaged. Furthermore, a user can be made to recognize clearly that it is incorrect wearing because the covering device material 130 which is some outer walls of the ink jet cartridge 116 ****s.

[0082] In addition, the fixed means of the covering device material 130 to the ink jet cartridge 116 is not restricted to the above-mentioned thermal melting start stage. For example, you may be an adhesion means to fix the welding pin 186 to the pin hole 135 of covering device material using the adhesives of optimum dose, and to fix the covering device material 130 to the ink jet cartridge 116. Moreover, you may be an attachment means to fix the covering device material 130 to the ink jet cartridge 116, by only a few's forming the outer diameter of the welding pin 186 thickly rather than the pin hole 135, and making the welding pin 186 and the pin hole 135 attach. Furthermore, the front faces of the ink jet cartridge 116 and the covering device material 130 may be fixed using a thermal melting start stage or an adhesion means, without forming the welding pin 186 and the pin hole 135.

[0083] Next, the further application of the ink jet cartridge shown in drawing 15 is shown in drawing 16 . Drawing 16 is the plan showing the covering device material and welding

pin in the further application of the ink jet cartridge shown in drawing 15 , and its A-A line sectional view.

[0084] As shown in drawing 16 , the configuration of the welding pin 286 may be formed so that a cross section may become an abbreviation cross-joint form. By making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since the welding area of the pin hole 235 of the covering device material 230 and the welding pin 286 becomes small, the welding reinforcement of the welding section 232,233 becomes small, and the desorption reinforcement of the covering device material 230 can be stopped low. Even if it does not make strict welding conditions, such as welding temperature at the time of melting the welding pin 286, and welding time amount, by this, caulking immobilization of the covering device material 230 can be carried out with the value near desired desorption reinforcement at the ink jet cartridge 216.

[0085] Thus, by making the cross-section configuration of the welding pin 286 into an abbreviation cross-joint form, since dispersion in the desorption reinforcement of the covering device material 230 is suppressed, the covering device material 230 can be more certainly desorbed at the time of incorrect wearing of the ink jet cartridge 216.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the outline of 1 operation gestalt of an ink jet recording device in which the ink jet cartridge of this invention is used.

[Drawing 2] It is the perspective view showing the whole 1 operation gestalt configuration of the ink jet cartridge of this invention.

[Drawing 3] It is the fluoroscopy perspective view of the ink jet ink jet recording head in the ink jet cartridge shown in drawing 2 .

[Drawing 4] It is the decomposition perspective view of the ink jet cartridge shown in drawing 2 .

[Drawing 5] It is the perspective view showing the ink jet cartridge shown in drawing 2 in the condition of having seen from [which was shown in drawing 2 R> 2] A.

[Drawing 6] It is the perspective view showing the rear face of covering device material shown in drawing 5 .

[Drawing 7] It is the perspective view showing the ink jet unit anchoring section in the ink tank shown in drawing 4 .

[Drawing 8] It is the perspective view showing the whole ink jet cartridge configuration shown in the carriage and drawing 2 of the ink jet recording apparatus shown in drawing 1 .

[Drawing 9] It is the plan showing the condition of equipping the carriage of the ink jet recording apparatus of right combination with the ink jet cartridge shown in drawing 2 .

[Drawing 10] It is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2 was mistaken.

[Drawing 11] It is the plan showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 2

was mistaken.

[Drawing 12] It is the perspective view showing the application of the ink jet cartridge shown in drawing 6 from drawing 2 .

[Drawing 13] It is the perspective view showing the rear face of covering device material shown in drawing 12 .

[Drawing 14] It is the perspective view showing the condition of equipping the carriage of the ink jet recording apparatus of combination by which the ink jet cartridge shown in drawing 12 was mistaken.

[Drawing 15] They are the plan showing the covering device material and welding pin of the ink jet cartridge shown in drawing 12 , and its A-A line sectional view.

[Drawing 16] They are the plan showing the covering device material and welding pin in the further application of the ink jet cartridge shown in drawing 15 , and its A-A line sectional view.

[Description of Notations]

1 Ink Jet Recording Device

2 Leading Screw

2a Spiral slot

3 Guide Rail

4 Drive Motor

5 Six Driving force transfer gear

7,107,207 Carriage

7a Dark room

7b Flange slot

8,108,208 Support plate

8a Notch

9 Hook Susceptor

9a Hook

9b Hook side

9c Fixed shaft

10 Recorded Media

11 Platen Roller

12 Paper Bail Plate

13 14 Photo coupler

15 Lever

16,116,216 Ink jet cartridge

17 Ink Jet Recording Head

18 Ink Jet Unit

19 Ink Tank

19a Ink jet unit anchoring section

19b Base

20 Capping Means

21 Supporter Material

22 Suction Means

23 Opening in Cap

24 Frame Part Material

25 Support Plate Material

26 Cleaning Blade
27 Lever
28 Cam
29 Gear
30,130,230 Covering device material
31 Enclosure
32 33,132,133,232,233 Welding section
34,134 Projection member
35,135,235 Pin hole
36 Claw Part
37 Delivery
38 Electric Thermal-Conversion Object
39 Liquid Ink Way
40 Heater Board
41 Common Liquid Room
42 Top Plate
43 Ink Receiving Window
44 Delivery Plate
45 Base Material
46 Wiring Substrate
47a, 47b, 48, 49, 53, 54,134 Projection
50, 51, 52, 56, 63, 68, 69 Hole
55 Ink Supply Pipe
57 58 Crevice
59 60 Parallel slot
61 84 Pad
62 Pressure Spring
64 It is who Section Front.
65 Ink Feed Zone Material
66 Ink -- Conduit
67 Closure Pin
70 Cartridge Body
71 Ink Absorber
72 Tank Lid
73 Ink Feed Hopper
74 Atmospheric-Air Free Passage Opening
75 *****
76 Flange
77 Roof Section
78 Slit
79 Closure Member
80 Top-Face Section
81 Clearance
82 Inferior-Surface-of-Tongue Section
83 Sheet Metal Member
85 Flexible Sheet

86,186,286 Welding pin

87 Escape and it is Stop.